The Complete Street: Revitalizing the Built Environment for Improved Public Health

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Abstract

Car dependency, poor public transportation infrastructure and a lack of mixed land use contribute to unhealthy lifestyles. Provincial legislation supports the development of healthy communities. The overweight and obesity levels in the City of Hamilton are higher than those in both Ontario and Canada. Citizens can take action to re-engineer physical activity back into their lives if they want to improve their health. Transdisciplinary planning is required by public health professionals, urban planners and engineers to find effective solutions that provide more opportunities for people to lead active lifestyles.

This study examines the relationship between health and the built environment to address the need for policies that will guide revitalization efforts in the City of Hamilton in order to establish a healthy and sustainable community. The complete streets approach is presented as a method to revitalize the built environment for improved public health. Complete streets practices in other cities are examined and both supporting policies and potential barriers to complete streets that exist in the City of Hamilton are identified. Policy recommendations are presented for the City of Hamilton to implement complete streets to provide a healthier and more sustainable community for current and future generations.
Introduction

“Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody.” – Jane Jacobs, The Death and Life of Great American Cities, 1961

We live in an increasingly urban world and where we live affects our health. Currently 85% of Ontario’s population lives in urban areas and by 2031 Ontario’s population is predicted to increase by 31% to 16.4 million, with 80% of this growth occurring in the Golden Horseshoe region (MNR, 2008). By 2031, Hamilton’s population is expected to increase to 660,000 (currently over 500,000) (Places to Grow, 2006). A holistic approach to city planning would help develop vibrant and diverse places that people will want to live and stay in; healthier and more sustainable cities for future generations to enjoy. The central question guiding this research is:

How can policies regarding health and the built environment contribute to revitalization efforts in Hamilton in order to establish a healthy and sustainable community?

The built, natural and social environments and their revitalization have a significant effect on the health and well-being of individuals. These environments are intimately connected and society should not ignore their linkages. If cities plan healthier built environments, the interactions amongst other elements in the ecosystem can improve. The physical environment is one of 12 key determinants of health that contribute to a person’s health status (OPHA, 2010). The built environment is one aspect of the physical environment and includes urban design, land use, buildings, infrastructure and transportation systems. Revitalization refers to restorative development, which includes redevelopment and the ongoing renewal of natural, built and social environments. Healthier built environments can enhance natural environments through conservation of greenspace and improved air and water quality. They can also provide community engagement opportunities through community gardens and multi-use trails, thus improving social environments. Current revitalization efforts in the City of Hamilton require transdisciplinary solutions that take into account social, political, economic, environmental and
health factors. Urban planning that is focused on developing healthy and sustainable cities is required to sustain cities for future generations (Barton et al, 2003; Northridge et al, 2003).

The Places to Grow Act and the Provincial Policy Statement provide the legislation for the development and growth of cities in Ontario and contain supportive language for the development of healthy communities. The Places to Grow Act provides the growth plan for the greater Golden Horseshoe area, which includes Hamilton. The main focus of the plan involves: revitalizing downtown cores, developing complete communities, reducing sprawl, and improving access to a variety of transportation options (Places to Grow, 2006). The Policy Statement, issued under the Planning Act, provides policy direction on land use planning to focus on building communities that are healthy, liveable and safe: “Efficient land use and development support strong, liveable and healthy communities, protect the environment and public health and safety, and facilitate economic growth” (MAH, 2010). The Ontario Public Health Association recently established a working group on health and the built environment that focuses on advocacy, health promotion and policy development. Ontario’s Provincial Policy Statement is currently under review; therefore the working group can influence the review to ensure that a focus on healthy planning policies is outlined in the statement. The City of Hamilton has an opportunity to get involved and become a leading city in planning for healthier and more sustainable communities.

**Healthy Cities/Communities Movement**

As discussed in Topalovic (2010) the concept of healthy cities was developed at the 1984 Beyond Health Care Conference, where a seminar inspired the World Health Organization (WHO) to develop the European Healthy Cities Project to improve the quality of life in 34 European cities (Norris & Pittman, 2000). The movement gained momentum in Canada after the WHO’s International Conference on Health Promotion in 1986, where the Ottawa Charter for Health Promotion was developed, adopting the WHO’s broad definition of health: a state of
complete physical, mental and social wellbeing (Perkins & Shields, 1998; VanLeeuwen, 1999). The Ontario Healthy Communities Coalition was established in 1993 and focuses on four key strategies for healthy community planning: community participation, multisectoral involvement, local government commitment and creating healthy public policies (OHCC, 2000).

Human health is a central aspect of sustainable communities (Corvalàn, 1999; Hancock, 2000). The connections between health, sustainability and the built environment have become a central aspect of public health and communities should address these connections to be healthy (Hancock, 2000). The main message of the movement is that health is determined by social, environmental and economic factors, and communities should work together across sectors to build healthy places.

Why Hamilton?

In 2009, Hamilton’s Chamber of Commerce spearheaded the Next Generation Project, an initiative aimed at attracting and retaining youth in Hamilton. The city realized that being a magnet for young talent is required to ensure Hamilton is a place where people want to live, work and play (NGC, 2010a). The project’s consultants developed a report on Next Cities, in which Hamilton placed 20th in a list of 27 (NGC, 2010b). Cities were compared in seven indexes, one being “Vitality”, which measures a city’s health, based on air and water quality, green space, and health factors including obesity and life expectancy (NGC, 2010b). Through focus groups and a web-based survey, Hamiltonians shared their frustrations with the car dependent nature of the city and a lack of transit facilities and opportunities for active transportation (NGC, 2010a). One respondent indicated that “downtown has highway-like roads and the trucks are allowed to race down them, chasing away pedestrians and bike commuters alike” (NGC, 2010a). At the 2010 Hamilton Economic Summit, the next generation delegates (comprised of students, recent graduates and young professionals), discussed actions to help Hamilton become a next city for the next generation. Many of the underlying themes related to
downtown and waterfront revitalization, developing urban gardens and living walls, improving bike lanes, improving transit through light rail adoption and developing the complete streets concept (HES, 2010). The next generation wants Hamilton to be a healthier place. Therefore, the city can focus on reordering the built environment to provide people with more reasons to choose Hamilton as a desirable place to live.

**Background: Relationship between Health and the Built Environment**

A vast amount of literature exists on health and the built environment surrounding land use planning, urban design, green buildings, greenspace, alternative transportation, safety, air and water quality, physical activity, chronic disease, and social capital (Williams & Wright, 2007; Northridge et al, 2003; Renalds et al, 2010; Frank et al, 2007; Prevention Institute, 2008; Freudenberg et al, 2006). Health Canada defines the built environment as a part of the earth’s ecosystem that encompasses all buildings, spaces, products and infrastructure that is created or modified by humans (Williams & Wright, 2007). Renalds (2010) defines it as “the human-made space in which people live, work and recreate on a day-to-day basis.” This environment has been planned and used by humans; therefore it has always had an impact on our health and the health of the environment in which we live. Williams & Wright (2007) summarize the features of the built environment as: land use (type, density); streets (design); sidewalks (location, connectivity); bicycle/walking paths; greenspace; public spaces and amenities; landscaping; and buildings. These features contribute to aspects of the built environment that can be revitalized to contribute to improved public health and more liveable cities.

Recognizing the breadth of the topic, the author chose to focus on the transportation aspects of the built environment, specifically complete streets, and the related public health effects because transportation issues are a recurring theme in Hamilton (NGC, 2010a; HES, 2010). Rapid transit for Hamilton has also been proposed within Metrolinx’s 15 year plan, supported by provincial and federal funding (A. Kirkpatrick, Manager, Transportation Planning, City of
Revitalization of the built environment provides both environmental and human health benefits; however for the purpose of the paper, human health will be the focus because physical inactivity and obesity have increasingly become public health concerns (Williams & Wright, 2007). This is not to say that environmental benefits do not exist, as there are many, including improved air and water quality, reduction in greenhouse gas emissions, ecosystem restoration, brownfield remediation, water and energy conservation, and climate change mitigation and adaptation (Williams & Wright, 2007; Frank et al, 2007; Younger et al, 2008).

Complete streets describe roads that are designed for safe use by all: vehicles, transit, bicycles and pedestrians. The concept of complete streets is not to focus on individual roads; instead the concept is to change the design process to include all users in the planning, designing, building and operating of all roadways; “It is about policy and institutional change” (LaPlante & McCann, 2008). Complete streets provide more access for all forms of transportation including active forms, such as walking and cycling. Implementing complete streets policies has many health and environmental benefits and helps to better accommodate people with disabilities, seniors and those of low socio-economic status who require affordable and safe options (LaPlante & McCann, 2008; McCann, 2005; Frank et al, 2007).

**Health Effects: Physical Activity, Obesity & Safety**

The focus of public health shifted from infectious and communicable diseases in the 19th century to chronic diseases in the 21st century, which includes cancer, diabetes, respiratory problems, obesity and cardiovascular disease. Northridge et al (2003) argues that stronger collaborations between urban planners and public health professionals are required to develop healthy cities. Land use strategies require healthy policies to ensure developments incorporate human health considerations. In North America, sedentary lifestyles have made people too dependent on automobile transport, shopping in big box stores and making poor food choices (Frank et al, 2007; Frumkin, 2002). If people want to improve their health they can advocate for more bicycle...
lanes, walking trails, pedestrian amenities, and improved frequency and connectivity of public transport. If local places become more diverse and dynamic, people will choose to live there (NGC, 2010a). Therefore, local policies need to adapt in order to build these places. Figure 1 summarizes the relationship between planning policies, the built environment and health.

There is a great deal of research surrounding physical activity, obesity and the built environment (Booth et al, 2005; Heart & Stroke Foundation, 2007; Williams & Wright, 2007). The U.S. Surgeon General’s 1996 Report on Physical Activity and Health demonstrated that strong evidence supported the relationship between physical activity and the following health outcomes: lower mortality rates, decreased risk of heart disease, stroke, colon cancer and type 2 diabetes, improved weight loss, and enhanced wellbeing (Williams & Wright, 2007). Car dependency, poor public transportation infrastructure and lack of mixed land use can contribute to obesity and physical inactivity (Renalds et al, 2010). Obesity and inactivity lead to an increased risk of coronary heart disease, diabetes, high blood pressure, osteoarthritis, and some cancers including breast, colon, esophagus, kidney and uterus cancer (Williams & Wright, 2007, CFLRI, 2005). The WHO estimates that “80% of cardiovascular diseases and type 2 diabetes and 40% of cancers could be avoided if major risk factors associated with the environment were eliminated” (Metcalf & Higgins, 2009). Public health officials regard the increase in “chronic disease rates associated with physical inactivity, sedentary lifestyles, overweight and obesity” as an “epidemic” (Williams & Wright, 2007). Figure 4 demonstrates the relationship between obesity and active transportation; obesity levels are lower in places with high levels of active transportation.
Canada’s physical activity guide recommends building physical activity into daily lives. The guide focuses on meeting the 60 minutes of required physical activity each day by accumulating time throughout the day with various activities, which is why walkability in neighbourhood design is an important factor (Public Health Agency of Canada, 2007). Increasing daily walking activities are realistic strategies for people to increase daily physical activity levels (Giles-Corti et al, 2009). Neighbourhood walkability influences decisions to choose walking as a form of transport. However, other factors exist that affect active living including age, socioeconomic status and mobility. Therefore, introducing active living at a young age and designing streets with safe access for all residents can contribute to healthy development for all people.

Street design affects safety, a major public health issue. Over 40% of pedestrian deaths in the US during 2007-08 occurred where no crosswalks were available (McCann, 2010). The presence of sidewalks, amount of on-street and surface parking, building placement and design, transit accessibility and visual quality improves the safety and appearance of streetscape, as well as the perception of an area’s safety and walkability (Frank et al, 2007). Engineers have a

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1 Original source: Pucher, “Walking and Cycling: Path to Improved Public Health,” Fit City Conference, NYC, June 2009
commitment to society and focus on safe design as part of their professional designation (PEO, 2010). Therefore, engineers can use complete streets strategies to design safer streets. Collaborating with urban planners and public health professionals would teach them about the broad range of public safety benefits that can be achieved through a different design approach. Street designs that do not support various transportation modes contribute to decreased safety since driver awareness of alternative transportation modes declines, creating dangerous situations for cyclists and pedestrians. As people are spending more time in cars, their risk of being in an accident increases (Frank et al, 2007). Traffic calming strategies (an element of complete streets) such as narrower lanes and street trees, can slow traffic and maintain efficient movement while establishing safer crossing areas for pedestrians (Frank et al, 2007).

Walking and cycling groups are coming together to take action on complete streets in order to create places that provide safe access for all users (TCAT, 2010; Geraghty, A. et al, 2009). The Centers for Disease Control and Prevention in the US recently recommended the adoption of a complete streets policy as a strategy to prevent obesity (NCSC, 2009). The case for complete streets is strengthened when considering the costs of physical inactivity and obesity in Canada. The current estimates are $5.3 billion\(^2\) and $4.3 billion\(^3\) in health care expenditures, respectively (CFLRI, 2005). Health and GDP have also been linked; the estimated total cost of cardiovascular disease can reduce a country’s GDP by 1 to 3% (Metcalfe & Higgins, 2009). Therefore, revitalizing the built environment is not only necessary to build healthy and safe places, but will also lead to health care savings. In order to meet the recommendations of Canada’s physical activity guide, people require more opportunities to walk and bike to locations. Frank et al (2007) argue that a holistic model of community design that maximizes health benefits would make active transportation both desirable and safe.

\(^2\) $1.6 billion in direct costs and $3.7 billion in indirect costs (CFLRI, 2005)
\(^3\) $1.6 billion in direct costs and $2.7 billion of indirect costs (CFLRI, 2005)
Land Use Planning

Williams & Wright (2007) discuss the impacts of planning on health, noting that municipal zoning in the early twentieth century resulted in regulations to separate residential areas from the “perceived negative impact of mixed uses.” The grid pattern planning of the past geared toward pedestrian use was replaced with disconnected networks through suburban development (Williams & Wright, 2007). Design changes in urban planning were based on the assumption that the personal automobile was the transport method of choice for individuals (Jackson & Kochtitzky, 2001; Kushner, 2007). Zoning, subdivision regulations and building codes originally intended to improve public health, safety and welfare (Frank et al, 2007; Kushner, 2007). Thus urban sprawl, which may have originally intended to build safer places, has actually led to the development of unhealthy communities (Frumkin, 2002). Sprawling cities, planned outward instead of upward, could continue to have negative effects on citizens’ health.

The Ontario Professional Planners Institute and the Ministry of Municipal Affairs and Housing developed a Healthy Communities Handbook to be used for planning and designing sustainable and healthy places (OPPI, 2010). The handbook is a tool that can be adopted by municipalities when reviewing and updating their Official Plans, Master Plans and design guidelines.

The Simcoe Muskoka District Health Unit recognized the need for stronger relationships between public health and land use planning in order to improve the health of their population. They developed a toolkit, Healthy Community Design: Policy Statements for Official Plans, for planners after surveying them to determine what they need to build healthier places. The toolkit addresses the five areas of the Health Unit, stating key objectives for each area with accompanying statements for Official Plans and supporting language from legislation (SMDHU, 2010). This can be used as an example for municipalities to follow and develop their own healthy community guidelines and policies.
Smart Growth policies are another example of land use policies that contribute to building healthy communities. Frank et al (2007) discuss how the built environment shapes transportation choices and in turn, human health. Smart growth communities are compact, have well-connected street and sidewalk networks, and support walking and biking more than isolated, automobile-dependent areas, resulting in improved fitness, reduced obesity, decreased traffic accidents and better air quality (Frank et al, 2007). Smart growth policies encourage: mixed land use, improvement of roadways to include access for all users (similar to complete streets), and prioritization of funding for alternative transportation. Smart Growth BC is a non-governmental organization in British Columbia that works with various partners and the public to create more liveable communities (Smart Growth BC, 2010). They are also part of the BC Healthy Built Environment Alliance. The Alliance was initiated by the province’s Health Services Authority and is a voluntary group that represents various sectors. They developed land use planning training resources for health professionals to help them cultivate relationships with planners and municipal officials. One of their projects was Wellness Walkways, a redevelopment of Vancouver’s Mount Pleasant neighbourhood to increase access for people with disabilities and seniors with limited mobility (BC PHSA, 2010).

**Analysis: Health, Transportation & Complete Streets in Hamilton**

**Community Health Profile of Hamilton**

Statistics Canada measures well-being through perceived health and perceived mental health, based on the population over age 12 who report their own health status as being very good or excellent (StatsCan, 2010a). Health includes the absence of disease and injury as well as physical, mental and social well being. Well-being is also measured through perceived life stress, based on the population over age 15 who report being stressed most days in their life (StatsCan, 2010a). Hamiltonians perceive their health and life stress to be better than people in their Peer Group, Ontario and Canada; however the level of perceived mental health is lower in
Hamilton, as shown in Table 1 (StatsCan, 2010a). Statistics Canada organizes health regions with similar characteristics into peer groups; Hamilton is part of Peer Group A (see appendix A for the full list). Although this data is self reported, it is still valid; in order to be healthy, a person needs to perceive themselves as being healthy. The levels of overweight and obesity are based on body mass index (BMI), where a BMI of 25.00-29.99 indicates overweight and a BMI greater than 30.00 indicates obese (StatsCan, 2010a). The levels of overweight and obesity in Hamilton are higher than levels in its Peer Group, Ontario and Canada, as shown in Table 1. Although the obesity levels are higher in Hamilton, the rates of leisure-time physical activity (moderately active or active) as reported by people over age 12 are higher in Hamilton (StatsCan, 2010a). This statistic is based on self reported data from responses to questions regarding the nature, frequency and duration of participation, therefore bias is built in. However, the results remain significant since only half of the population of either group report themselves as being moderately active or active. Obesity has increasingly become a greater public health concern; therefore revitalizing the built environment to provide more options for active living can help address the high obesity levels in Hamilton.

Table 1: Community Health Indicators in Hamilton compared to Peer Group A, Ontario and Canada (StatsCan, 2010a)

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Hamilton (%)</th>
<th>Peer Group A (%)</th>
<th>Ontario (%)</th>
<th>Canada (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived health (very good or excellent)</td>
<td>63.7</td>
<td>61.1</td>
<td>61.2</td>
<td>60.5</td>
</tr>
<tr>
<td>Perceived mental health (very good or excellent)</td>
<td>71.8</td>
<td>74.3</td>
<td>74.0</td>
<td>73.9</td>
</tr>
<tr>
<td>Perceived life stress</td>
<td>22.1</td>
<td>24.4</td>
<td>24.3</td>
<td>23.2</td>
</tr>
<tr>
<td>Overweight levels</td>
<td>40.0</td>
<td>34.9</td>
<td>34.0</td>
<td>33.7</td>
</tr>
<tr>
<td>Obesity levels</td>
<td>19.4</td>
<td>18.5</td>
<td>17.4</td>
<td>17.9</td>
</tr>
<tr>
<td>Leisure-time physical activity, moderately active or active</td>
<td>54.7</td>
<td>53.8</td>
<td>50.7</td>
<td>52.5</td>
</tr>
</tbody>
</table>

**Hamilton’s Public Transportation Review**

Over 175 Hamilton Street Railway (HSR) public transit buses are on the road everyday that serve 21 million passengers per year, or 50 rides per person per year (IBI, 2009). Hamilton’s Vision 2020 calls for transit usage to double to 100 rides per person per year and the
Transportation Master Plan sets a target for 2031, to reduce auto vehicle-km by 20% (IBI, 2009). To achieve these targets, the HSR would have to double service hours and add 10-15 buses per year until 2021 (IBI, 2009). Systems in Canada that have achieved this goal currently use some form of rapid transit – Ottawa, Toronto and Montreal. The IBI Group (2009) demonstrated in a presentation to city council that generally HSR services operate within industry standards for comparable municipalities. However, to improve operational issues the city should: increase service hours, adjust schedules and routes, improve signal timing at intersections, and implement transit priority measures. To promote ridership growth, the IBI Group (2010) recommends the implementation of strong land use policies such as: reduction in parking; infill development and increased density around transit hubs; controlling sprawl of commercial development (big-box stores); and enforcing design guidelines for new development. The recommendations of the report support elements of complete streets and therefore improve citizen health. Increasing the frequency and connectivity of transit and the development of high density transit hubs will help make transit a more attractive mode and support improvements in walkability; therefore, providing more opportunities for people to walk and bike to transit stations, while increasing daily physical activity levels (Frank et al, 2007).

**Complete Streets Best Practices**

Transportation is greatly affected by land developments and has an impact on the areas in which growth occurs in a city. According to Williams & Wright (2007) alternative transportation is only possible when it is supported by decisions that consider both land use and infrastructure decisions. Northridge et al (2003) argues that a strategy for mitigating air quality and traffic problems while also encouraging alternative transit is to improve the accessibility and connectivity to services and transit stations within urban areas. Urban roadways are typically designed as arterials, intended to provide mobility and increased traffic carrying capacity. These
streets require wide lanes, increased turning radii and minimum interference with traffic movements, leading to roads that divide neighbourhoods (LaPlante & McCann, 2008).

The complete streets vision varies depending on the place. In urban areas it can include features for all modes of transportation; whereas in rural areas, only a paved shoulder may be required. Complete streets policies require changes that institutionalize the approach. The approach is “more than simple allocation of street space” (LaPlante & McCann, 2008). It also involves setting design speeds to allow safe travel for all users. Traffic calming measures used include: narrow and reduced lanes, tighter corner curb radii, median landscaping, and curb bulb-outs to shorten pedestrian crossings (LaPlante & McCann, 2008). Complete streets can include: main street initiatives; bicycle, pedestrian and transit plans; and consideration for disabled users - “the idea is that multimodal corridors would become the default mode” (McCann, 2005).

In the US, elements of complete streets policies have been in place since 2001 when the US Department of Transportation issued design guidance in response to the Transportation Equity Act of 1998, which included language promoting bicycle and pedestrian travel (McCann, 2005). Oregon first adopted the complete streets idea in the US with their Bike Bill in 1971, requiring bicycle and pedestrian facilities on all new roads, streets, and highways (McCann, 2005). In Corvallis, Oregon, 95% of arterial roads include bike lanes. In Portland, the bike lane network has led to increases in bicycle commuting and has introduced both bike lanes and sidewalks in rural and suburban areas (McCann, 2005). The National Complete Streets Coalition in the US works to transform streets by changing their planning, design and construction through the development of complete streets policies. Since 2005, over 125 jurisdictions in the US have adopted some type of complete streets policy at the town and state level (McCann, 2010). The Coalition’s website contains extensive information regarding complete streets policy; for more information see http://www.completestreets.org/.
New York City’s Transportation commissioner, Janet Sadik Khan, had a vision of liveable streets and in 2008, the New York City Department of Transportation (NYCDOT) released a sustainable streets strategic plan. The plan adopts the complete streets concept as the transportation policy for the city and has initiated many successful projects to transform streets into more complete, sustainable and liveable ones. Since 2006, they completed 200 miles of on-street bicycle lanes, introduced 2 way and separated bicycle lanes, and developed Summer Streets (similar to Ciclovia in Bogotá, Columbia), where streets are closed to motor vehicles on Saturdays in August. Ciclovia is an initiative where main streets are closed to cars on Sundays and holidays to provide more opportunities for walking and biking. The program has successfully led to many transportation initiatives in Bogotá: the addition of 300km of bicycle paths, car free days, and the development of the Transmilenio System which provides dedicated bus lanes, (Parra et al, 2007). As a result, physical activity levels increased and more people are using bicycles as a means of transportation (Parra et al, 2007).

A successful project in New York was Green Light for Midtown, which focussed on mobility and safety problems in midtown Manhattan. The plan involved closing Broadway Avenue to motor vehicles through Times and Herald Squares since Broadway intersections contribute to higher congestions and crash rates when compared to others (NYCDOT, 2010). Many features of complete streets were implemented: shortening crosswalks, traffic signal timing changes, lane reductions, clearly marked roads for cars, bikes and pedestrians, and the development of pedestrian plazas (NYCDOT, 2010). The changes improved mobility and safety and increased the pedestrian use of the spaces. GPS systems on taxis were used to evaluate travel speeds, determining that the speed of taxi trips improved on Broadway, 6th and 7th Avenues. Injuries to both motorists and pedestrians decreased, by 63% and 35%, respectively. Pedestrian traffic increased in Times Square by 11% and in Herald Square by 6%, indicating that more people are choosing to walk and spend time in the pedestrian plazas (NYCDOT, 2010). Green Light for
*Midtown* started as a pilot project in 2008, however the improvements have made it a sustainable renewal of city streets and this was only one of the many elements of complete streets that were implemented throughout the city. Two main factors contributed to the project’s success. The NYCDOT promoted the plan as a ‘pilot’ project, enabling people to test out the changes, assuring them that changes would only be permanent if mobility and safety were improved. They also engaged citizens through surveys and allowed them to take ownership through a plaza design competition (NYCDOT, 2010). The project is an example that even small changes can improve mobility and safety in one of the largest and busiest cities in the world.

In Canada, there are no specific complete streets policies in place; however some municipalities are working towards them. A Complete Streets Forum was held in Toronto on April 23, 2010, organized by the Toronto Coalition for Active Transportation, where experts presented design solutions for creating safe and complete streets for all users (TCAT, 2010). Some presentations focused on municipalities in Ontario, specifically York Region, Mississauga and Burlington. York Region developed a complete streets plan in response to population growth and development. Currently their Official Plan, Transportation Master Plan and Pedestrian and Cycling Master Plan support a vision to transform arterial roads to complete streets (Cheah, 2010). York Region already has vivaNext rapid busses that service the region for more efficient travel. They are developing Rapidways, which are dedicated lanes for vivaNext busses and are planning to implement light rail. Figure 2 demonstrates a complete streets plan for Hwy 7 with the rapidway in the centre to accommodate rapid bus and light rail transit (Cheah, 2010). Calgary is another city focused on complete streets in Canada. In 2009, the city adopted a new Municipal Development Plan and Transportation Plan that include complete streets as a key objective for the city (City of Calgary, 2009). The Sustainable Alberta Association is a non-profit organization composed of representatives from business, government and the non-profit sector, who volunteer to promote sustainable transportation for improved health of citizens. They provide
complete streets workshops to train residents, community leaders and municipal staff on design concepts, sustainable transportation, public education and implementing complete streets in their community (SAS, 2010).

Montreal’s BIXI program is a positive example of moving towards complete streets and Toronto recently adopted the same program. BIXI is a public bike system based on the Vélib system in Paris. There are over 300 BIXI stations throughout Montreal, which are powered by solar panels, throughout a network of over 500km of bike lanes (BIXI Montreal, 2010). The system has been successful in the city because their Transportation Plan focuses on reducing the reliance on cars and increasing the opportunities for active transportation (Ville de Montréal, 2010). For Montreal, the BIXI system is a step towards reaching the success that European cities have achieved in cycling culture. In both Amsterdam and Copenhagen, the percentage of cycling trips is higher than all other forms of transportation, as shown in Table 2. Also included in Table 2 are the percentages of trip types in Hamilton, Ontario and Canada; which demonstrates the car culture. The Canadian data only includes work trips as reported in the 2006 Census (StatsCan, 2008, StatsCan, 2009); whereas the European data includes all trips (Fietsberaad, 2009). Although not directly comparable, the data demonstrates that the Canadian car culture is much greater than that of Amsterdam and Copenhagen. Cycling is so widespread in these cities when compared to a typical North American city because it is part of the lifestyle and is central to the way the cities are planned. Amsterdam and Copenhagen, similar to other European cities, have mixed land use, less sprawl and therefore shorter distances between destinations. Copenhagen has a people approach to urban design, strongly driven by bicycle policies and strong political support (Fietsberaad, 2009). Amsterdam is the only city in the Netherlands where three levels of government are involved in traffic policy (Fietsberaad, 2009). Strong government support for cycling initiatives has encouraged a sustainable cycling culture in these cities; enabling them to focus on both infrastructure and behavioural change.
Table 2: Percentage of Inhabitant’s Trips in Copenhagen & Amsterdam, Compared to Work Trips in Hamilton, Ontario and Canada (Fietsberaad, 2009; StatsCan, 2008; StatsCan, 2009)

<table>
<thead>
<tr>
<th></th>
<th>Copenhagen</th>
<th>Amsterdam</th>
<th>Hamilton CMA</th>
<th>Ontario</th>
<th>Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Transport</td>
<td>15%</td>
<td>18%</td>
<td>8%</td>
<td>13%</td>
<td>11%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>32%</td>
<td>28%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Car</td>
<td>26%</td>
<td>27%</td>
<td>85%</td>
<td>79%</td>
<td>80%</td>
</tr>
<tr>
<td>Walking</td>
<td>24%</td>
<td>24%</td>
<td>5%</td>
<td>6%</td>
<td>7%</td>
</tr>
<tr>
<td>Other</td>
<td>3%</td>
<td>3%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
</tr>
</tbody>
</table>

**Complete Streets for the City of Hamilton**

Supporting polices for and potential challenges to complete streets exist in the City of Hamilton. The Gore Park Master Plan is one example of how Hamilton’s streets can be revitalized for all users. Appendix B includes photos of the current state of and future plan for the Gore Park area in downtown Hamilton. Similar to Times and Herald Square in New York, the south leg of King St. East would be closed off to create a pedestrian plaza that connects with the existing Gore Park (City of Hamilton, 2009a). Although it is not a complete streets plan, it is an example of potential positive changes to Hamilton’s streets and can be used as a first step towards implementing complete streets in the city. Complete Streets visuals of New York City are included in Appendix C, as an example of successful changes that can be implemented in a city. The complete streets concept will look different in each place; therefore no one formula will work. Many streets in Hamilton could benefit from a complete streets strategy, especially its two main, one-way streets, King and Main, which are major arterial roads that are only designed for

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4 Hamilton CMA data includes data from the City of Burlington (StatsCan, 2009)
motorized vehicles, as shown in Figures 4 and 5. The light rail transit corridor is being proposed on these streets, therefore with its implementation, these major arterials will have to be transformed for more safe and efficient travel for all users.

**Figure 4: Main St. W. (Photo Credit: M. Topalovic, 2010)**

**Figure 5: King St. W. (Photo Credit: M. Topalovic, 2010)**

**Supporting Policies**

According to Kirstin Maxwell, Policy Planner for the City of Hamilton (personal communication), planners focus on healthy community planning. They are members of an Obesity Network that works to improve the health of communities and the built environment. Public Health professionals provide input into Official Plans (OP) and Secondary Plans. Hamilton’s Vision 2020 and the new Urban OP (still awaiting provincial approval), have supportive language and a vision for complete streets woven throughout them (K. Maxwell, personal communication). Complete Streets is directly mentioned in the OP under Section 4.2.8: Urban Design and Complete Streets, which encourages that design guidelines for secondary plans “shall incorporate” roads that allow for efficient movement through communities for all users (City of Hamilton, 2009b). The section description is included in Appendix D. Therefore new zoning and developments could achieve these design changes. The new OP will force changes in design standards in new developments and support land dedication for sidewalks and bike lanes (K. Maxwell, personal communication).

Hamilton’s Transportation Master Plan and Cycling Master Plan also support complete streets and promote alternative transportation. The International Walking Charter was signed in April
2008 by Hamilton’s mayor, Fred Eisenberger (A. Boschler, Hamilton Public Health, personal communication). The charter demonstrates a commitment of cities to promote and design walkable places to provide active living opportunities. As a result, Public Works and Public Health are working on the development of a Pedestrian Master Plan (A. Boschler, personal communication); a positive example of some transdisciplinary planning between engineers and health professionals. City Council also recently approved the adoption of Transit Oriented Development (TOD) guidelines as a method to implement the Transportation Master Plan and Urban OP (A. Kirkpatrick, Manager of Transportation Planning, personal communication). TOD promotes transit use through mixed use development, higher densities near transit areas, and walkable areas with pedestrian amenities (A. Kirkpatrick, personal communication).

The Smart Commute program, through Public Works, supports complete streets. The program focuses on promoting alternative transportation and spearheaded Open Streets, which is based on Ciclovia in Bogotá. This successful event involved the closing of James St. North to motor vehicles for a celebration of alternative and active transportation (Smart Commute Hamilton, 2010). Open Streets can serve as a public awareness tool for complete streets if it is held more frequently to initiate behaviour change, as it has done in Bogotá (Parra et al, 2007).

Potential Challenges

Certain challenges can hinder the implementation of complete streets. Although supporting policies exist, developers have to see a market for this type of development and the city might have to provide incentives for them to do so (A. Kirkpatrick, personal communication). Developments such as the Ancaster Meadowlands, primarily big box stores with car centred access, continue to be constructed in the city. The Centre Mall redevelopment in the east end of Hamilton and the Heritage Green Retail Development on the east mountain are two examples of low density development, both established within the past year. City Councillors can work closely with developers to encourage more high density development to build healthier places.
According to Kirstin Maxwell (personal communication), public opposition to transportation planning is a major obstacle for complete streets. From lane reductions to new bike lane construction, nimbyism exists and public education is the key to changing this behaviour. A recent example of this is residents’ opposition to the development of a cycling path over a rail yard to provide safer access from the west end of Hamilton to McMaster University. The culture in Hamilton has to change in the development community with regards to urban design. If citizens want to live in healthier places, they can encourage developers to adopt healthier designs by driving up demand for development based on smart growth principles.

Another potential barrier exists between planners and engineers in terms of working together towards the same goals (K. Maxwell, personal communication). Planners can plan for healthier built environments; however engineers carry out the designs to implement healthier places. More transdisciplinary planning that involves engineers, planners and public health professionals can mitigate at least some of the challenges that exist.

Policy Implications and Recommendations

The elements of complete streets policies exist in the City of Hamilton, therefore the following policy recommendations can help achieve the concept in order to revitalize the built environment for a healthier and more sustainable community.

**Recommendation #1: Develop a Complete Streets Policy for Hamilton**

The Transportation, Cycling, and soon-to-be developed Pedestrian Master Plans can be integrated into a Complete Streets Policy. According to Kirstin Maxwell (personal communication) although the language is woven within the OP and the Master Plans, for Hamilton to adopt the complete streets concept, a clear vision is required. The National Complete Streets Coalition’s (2009) website contains guidelines for complete streets policies and examples of policies from various states. An example of North Carolina’s policy is included
in Appendix E, which can be used as an example for Hamilton. It makes reference to supporting bicycle and pedestrian polices that it builds upon, similar to what can be done with Hamilton’s Master Plans. Within this recommendation, evaluation metrics should be developed to assess the effectiveness of complete streets features implemented in the city. Modal choices can be evaluated to determine if cycling, walking and transit use increase after the policy adoption, using census data and transportation surveys (StatsCan, 2010b; UofT, 2009). The kilometres of bicycle lanes and transit service improvements can also be assessed.

Challenges: Some of the challenges to implementing a Complete Streets Policy are the time, effort and costs required from city staff. A lack of transdisciplinary planning is not conducive to the type of planning that is required for realizing healthy communities. The city also requires the leadership necessary to advance the policy and someone that will champion the revitalization efforts and focus on healthy communities.

Resolutions: The Transportation, Cycling and the soon-to-be developed Pedestrian Master Plan can contribute to the Complete Streets Policy. The work for these plans is completed, thus decreasing the amount of additional work required. Collaborating with other municipalities, such as those who attended the Complete Streets Forum in Toronto, can help Hamilton gain a better understanding of what is required for the policy. Developing a strong leader to champion the concept and efforts is difficult, however the recent city council decision to support the west harbour Pan Am Games site versus a suburban east mountain site, demonstrates that this type of leadership does exist, even if it is currently in small forms (The Hamilton Spectator, 2010).

Recommendation #2: Create a Committee of Council on Health and the Built Environment

A committee that focuses specifically on developing healthier built environments would take action on complete streets and other factors regarding health and the built environment. The committee will only be effective if it crosses transdisciplinary boundaries (Northridge et al, 2003; Renalds et al, 2010). It should include Public Works and Public Health staff, planners,
engineers, city council, and citizens. Without an understanding of the interconnections between environmental, social, political and economic factors, healthy public policies cannot be made.

**Challenges:** It will be challenging to gather the right people for the committee, those who understand the need for healthier built environments. There may also be opposition to creating a new committee, since it may not be effective when too many committees already exist.

**Resolutions:** City employees who are passionate about building healthy communities can organize themselves as a coalition to work collaboratively on projects, similar to Public Works and Public Health’s collaboration on the Pedestrian Master Plan. Once complete, it can be used as an example to demonstrate that there is a need for similar work to be accomplished through a committee. If there is strong opposition to a new committee, quarterly workshops or an annual summit on health and the built environment could be planned. This would provide opportunities for a diverse range of people to get involved, including students.

**Recommendation #3:** Hamilton Public Health Department should develop a healthy communities toolkit, similar to the Simcoe Muskoka District Health Unit.

Creating a similar toolkit would enable staff to develop the language required to support complete streets to put directly into the OP. This would enable them to have policy statements readily available for a Complete Streets Policy as well.

**Challenges:** The main challenge in developing a toolkit is the resources it requires to create it.

**Resolutions:** Staff can use the health unit’s toolkit as a template since it is available for municipalities on their website (SMDHU, 2010). The health unit has already reviewed the necessary legislation; therefore Hamilton’s Public Health staff would just have to change the format to fit with their goals. It would be useful to meet with the health unit for further guidance.

**Recommendation #4:** Public Awareness, Education and Advocacy

Although infrastructure changes are a large requirement to implement complete streets, behaviour changes in citizens is also a requirement and a key challenge. Developing a cycling
culture similar to Amsterdam and Copenhagen may not be realistic for Hamilton in the short term; however it can be a long term goal. Renalds et al (2010) argues that educating the public about the connections between health and the built environment is vital for increasing awareness and influencing land use priorities. Existing networks in Hamilton can unite as one voice to promote complete streets. Environment Hamilton, the Hamilton Cycling Committee, Green Venture, Transportation for Liveable Communities, and Hamilton Walks can collaborate on advocacy, which will also provide benefits for each group. Smart Commute can be used to provide education tools for the community through workshops, more events such as Open Streets Hamilton, and in-school programs, including Stepping It Up (Transport Canada, 2010). Strong community support is required to demonstrate to policy-makers and city councillors that the health of a city is just as important as the wealth of a city.

**Challenges:** The major challenges include: resources, costs, lack of a central Public Relations office, and resident opposition. For example, Hamilton City Councillor Brian McHattie received opposition for removing parking on one side of Dundurn St. South in order to provide bike lanes on both sides of the street (K. Maxwell, personal communication).

**Resolutions:** Although no central PR office exists, Smart Commute can be used as a central promotion tool for complete streets initiatives. Since Smart Commute already exists and has programs in place, these programs can be further developed and focused on complete streets. More resources will be required; however existing funding through the initiative provides an initial seed. The OHCC can help address the lack of resources since they already work with some communities in Hamilton (J. McDonnell, OHCC, personal communications). The committee on health and the built environment can work with Business Improvement Areas (BIAs) in Hamilton to develop programs on a community level. If BIAs understand the value in complete streets, they can work to make it a priority in their communities. A Complete Streets Design Competition can be developed where BIAs submit a complete streets idea to improve their neighbourhood. The best design concept that addresses health issues would be chosen
and developed in the winning neighbourhood. The competition would provide community engagement opportunities by including citizens in the design process. McMaster University and Mohawk College students can also be involved with design work and support, providing more engagement opportunities for the next generation. Local businesses could provide funding for the competition as it would help improve their corporate social responsibility and the neighbourhoods in which they work.

The Code Red Series (Buist, 2010) in the Hamilton Spectator revealed the disparities in health among different neighbourhoods in Hamilton. This demonstrates the need to plan healthier places for all people and to encourage health professionals to become proponents for complete streets. Renalds et al (2010) argues that there exists a need for healthcare professionals to get involved with health and the built environment advocacy since they can provide a strong voice in the discussion on community health.

**Recommendation #5: Training**

A fundamental challenge to instituting a complete streets policy is the lack of holistic approaches to training in transportation related fields (McCann, 2005). Training engineers, urban planners, technicians, policymakers and health professionals about complete streets is necessary for successful implementation. If this training is provided in undergraduate and graduate school programs, a new age of planners, engineers, technicians, etc, will be equipped with the necessary skill set and will understand the need for this type of planning.

**Challenges:** Finding the expertise and the funding to develop these programs is a challenge. This recommendation also requires a change in undergraduate and graduate programs to reflect healthy community planning, especially within engineering disciplines.

**Resolutions:** The Regeneration Institute for the Great Lakes (REIGL) can assist with providing training for engineers, technicians, municipalities and other professionals. REIGL is focussed on training and educating municipalities, practitioners and students on concepts surrounding
restorative development in the Great Lakes region (G. Krantzberg, personal communication). Funding for their programs will be required in order to provide complete streets specific training. The McMaster Institute for Transport and Logistics is another group that can collaborate with REIGL to provide training. Both the city and the province should be considered for funding opportunities. A new generation of engineers are required to meet transportation design challenges and respond to the need for healthier public policies. Engineering programs should focus on revitalization and sustainability, such as McMaster University’s Engineering and Society program, which is an example of positive changes to undergraduate engineering education (McMaster University, 2010).

**Conclusion**

The development of a Complete Streets Policy for the City of Hamilton would help the city focus on addressing the relationship between health and the built environment. The policy would assist with achieving the recommendations of the Transportation and Cycling Master Plans, while also fulfilling the requirements of the Urban Official Plan and Vision 2020. Alongside of supporting their plans, the policy will also address the high overweight and obesity levels in the city through the promotion of active transportation. The potential success of revitalizing the built environment through complete streets will not come without public support. The city and its citizens should work together to improve their health and the health of the community in which they live. The complete streets examples from other cities around the world demonstrate the means of providing more complete, sustainable and liveable streets. Through the implementation of the recommendations outlined in this study and learning from the examples provided, the City of Hamilton has the potential to establish a healthy and sustainable community for current and future generations.
References


Appendix A: Statistics Canada Peer Group A

The list includes all of the health units within Peer Group A (StatsCan, 2010a).

Health regions - Peer group A
Brandon Regional Health Authority (4615-A), Manitoba
Brant County Health Unit (3527-A), Ontario
Central Vancouver Island Health Service Delivery Area (5942-A), British Columbia
Chinook Regional Health Authority (4821-A), Alberta
City of Hamilton Health Unit (3537-A), Ontario
District Health Authority 9 (1219-A), Nova Scotia
Eastern Ontario Health Unit (3558-A), Ontario
Elgin-St. Thomas Health Unit (3531-A), Ontario
Fraser East Health Service Delivery Area (5921-A), British Columbia
Haldimand-Norfolk Health Unit (3534-A), Ontario
Haliburton, Kawartha, Pine Ridge District Health Unit (3535-A), Ontario
Hastings and Prince Edward Counties Health Unit (3538-A), Ontario
Kingston, Frontenac and Lennox and Addington Health Unit (3541-A), Ontario
Lambton Health Unit (3542-A), Ontario
Leeds, Grenville and Lanark District Health Unit (3543-A), Ontario
Middlesex-London Health Unit (3544-A), Ontario
Niagara Regional Area Health Unit (3546-A), Ontario
North Vancouver Island Health Service Delivery Area (5943-A), British Columbia
Okanagan Health Service Delivery Area (5913-A), British Columbia
Oxford County Health Unit (3552-A), Ontario
Peterborough County-City Health Unit (3555-A), Ontario
Queens County (1102-A), Prince Edward Island
Regina Qu'Appelle Regional Health Authority (4704-A), Saskatchewan
Région de l'Estrie (2405-A), Quebec
Région de l'Outaouais (2407-A), Quebec
Région de la Capitale-Nationale (2403-A), Quebec
Région de la Montérégie (2416-A), Quebec
Région de Lanaudière (2414-A), Quebec
Région de Laval (2413-A), Quebec
Région des Laurentides (2415-A), Quebec
Saskatoon Regional Health Authority (4706-A), Saskatchewan
South Vancouver Island Health Service Delivery Area (5941-A), British Columbia
Thompson/Cariboo Health Service Delivery Area (5914-A), British Columbia
Windsor-Essex County Health Unit (3568-A), Ontario
Winnipeg Regional Health Authority (4610-A), Manitoba
Zone 6 (1206-A), Nova Scotia
Appendix B: Gore Park Master Plan

Figure B1: Current View of Gore Park, south leg of King St. E. shown on the right side
(Photo Credit: M. Topalovic, 2010)

Figure B2: Gore Park Plan, south leg of King St. E. replaced with a Pedestrian Plaza on the right side (City of Hamilton, 2009a)
Appendix C: Complete Streets Visuals

The following figures demonstrate the complete streets features implemented in New York City through before and after photos of Herald Square, Times Square and Columbus Circle (NYCDOT, 2010).

Figure C1 (a): Herald Square before complete streets strategies (b) Herald Square after

Figure C2 (a): Times Square before complete streets strategies (b) Times Square after
Figure C3 (a): Columbus Circle before complete streets strategies (b) Columbus Circle after
Appendix D: Urban Hamilton Official Plan Section 4.0

The supportive language for complete streets is found in Section 4.0: Integrated Transportation Network, page 105-106 of the Urban Hamilton Official Plan (City of Hamilton, 2009b).

Urban Design and Complete Streets

4.2.8 New secondary plans and designs for major transit generators shall incorporate the following design directions:
   a) establishment of a continuous grid road network as the preferred street layout to allow pedestrians, cyclists, transit vehicles, automobiles and goods and services vehicles to move efficiently through communities;
   b) efficient spacing of arterial and collector roads within the grid network;
   c) organization of land uses in a manner that reduces automobile dependence and improves modal choice and the movement of goods;
   d) placement of higher density land uses near existing and planned transit stop/station locations;
   e) street design and layout which reduces and minimizes the need for future traffic calming and/or unnecessary traffic control devices; and,
   f) all other applicable design guidelines and design policies of Volume 1, including Section B.3.3 – Urban Design Policies and Chapter E – Urban Systems and Designations.

4.2.10 Development of major transit generators shall provide safe and convenient pedestrian and cycling environments and access through building orientation, site layout, traffic management, and the provision of facilities such as sidewalks, crosswalks, bike lanes and trails, bicycle parking and loading, and connections to transit service.

4.2.11 The City shall encourage new development to be located and designed to minimize walking distances to existing or planned transit and facilitate the efficient movement of goods where feasible.

4.2.12 The road network shall be planned and designed to:
   a) be shared by all modes of transportation;
   b) maximize safety for all uses; and,
   c) minimise lifecycle environmental impacts in accordance with Section C.4.5 - Road Network.
Appendix E: North Carolina’s Complete Streets Policy

NCDOT July 2009 Board of Transportation Agenda
Division of Bicycle and Pedestrian Transportation
Complete Streets Policy

A. Definition

Complete Streets is North Carolina’s approach to interdependent, multi-modal transportation networks that safely accommodate access and travel for all users.

B. Policy Statement

Transportation, quality of life, and economic development are all undeniably connected through well-planned, well-designed, and context sensitive transportation solutions. To NCDOT, the designations “well-planned”, “well-designed” and “context-sensitive” imply that transportation is an integral part of a comprehensive network that safely supports the needs of the communities and the traveling public that are served.

The North Carolina Department of Transportation, in its role as stewards over the transportation infrastructure, is committed to:

- providing an efficient multi-modal transportation network in North Carolina such that the access, mobility, and safety needs of motorists, transit users, bicyclists, and pedestrians of all ages and abilities are safely accommodated;
- caring for the built and natural environments by promoting sustainable development practices that minimize impacts on natural resources, historic, businesses, residents, scenic and other community values, while also recognizing that transportation improvements have significant potential to contribute to local, regional, and statewide quality of life and economic development objectives;
- working in partnership with local government agencies, interest groups, and the public to plan, fund, design, construct, and manage complete street networks that sustain mobility while accommodating walking, biking, and transit opportunities safely.

This policy requires that NCDOT’s planners and designers will consider and incorporate multimodal alternatives in the design and improvement of all appropriate transportation projects within a growth area of a town or city unless exceptional circumstances exist. Routine maintenance projects maybe excluded from this requirement; if an appropriate source of funding is not available.

C. Purpose

This policy sets forth the protocol for the development of transportation networks that encourage non-vehicular travel without compromising the safety, efficiency, or function of the facility. The purpose of this policy is to guide existing decision-making and design processes to ensure that all users are routinely considered during the planning, design, construction, funding and operation of North Carolina’s transportation network.

D. Scope and Applicability

This policy generally applies to facilities that exist in urban or suburban areas, however it does not necessarily exclude rural setting; and is viewed as a network that functions in an interdependent manner.

There are many factors that must be considered when defining the facility and the degree to which this policy applies, e.g., number of lanes, design speeds, intersection spacing, medians, curb parking, etc. Therefore, the applicability of this policy, as stated, should be construed as neither comprehensive nor conclusive. Each facility must be evaluated for proper applicability.

Notwithstanding the exceptions stated herein, all transportation facilities within a growth area of a town or city funded by or through NCDOT, and planned, designed, or constructed on state maintained facilities, must adhere to this policy.

E. Approach

It is the Department’s commitment to collaborate with cities, towns, and communities to ensure pedestrian, bicycle, and transit options are included as an integral part of their total transportation vision. As a partner in the development and realization of their visions, the Department desires to assist localities, through the facilitation of long-range planning, to optimize connectivity, network interdependence, context sensitive options, and multimodal alternatives.

F. Related Policies

This policy builds on current practices and encourages creativity for considering and providing multi-modal options within transportation projects, while achieving safety and efficiency.

Specific procedural guidance includes:

- Bicycle Policy (adopted April 4, 1991)
- Highway Landscape Planting Policy (dated 6/10/88)
- Board of Transportation Resolution: Bicycling & Walking in North Carolina, A Critical Part of the Transportation System (adopted September 8, 2000)
- Guidelines for Planting within Highway Right-of-Way
- Bridge Policy (March 2000)
- Pedestrian Policy Guidelines –Sidewalk Location (Memo from Larry Goode, February 15, 1995)
- Pedestrian Policy Guidelines (effective October 1, 2000 w/Memo from Len Hill, September 28, 2000)
- NCDOT Context Sensitive Solutions Goals and Working Guidelines (created 9-23-02; updated 9-8-03)

G. Exceptions to Policy

It is the Department’s expectation that suitable multimodal alternatives will be incorporated in all appropriate new and improved infrastructure projects. However, exceptions to this policy will be
considered where exceptional circumstances that prohibit adherence to this policy exist. Such exceptions include, but are not limited to:

- facilities that prohibit specific users by law from using them,
- areas in which the population and employment densities or level of transit service around the facility does not justify the incorporation of multimodal alternatives,

It is the Department's expectation that suitable multimodal alternatives will be incorporated as appropriate in all new and improved infrastructure projects within a growth area of a town or city.

As exceptions to policy requests are unique in nature, each will be considered on a case-by-case basis. Each exception must be approved by the Chief Deputy Secretary.

Routine maintenance projects maybe excluded from this requirement; if an appropriate source of funding is not available.

**H. Planning and Design Guidelines**

The Department recognizes that a well-planned and designed transportation system that is responsive to its context and meets the needs of its users is the result of thoughtful planning. The Department further recognizes the need to provide planners, designers and decision-makers with a framework for evaluating and incorporating various design elements into the planning, design, and construction phases of its transportation projects. To this end, a multi-disciplined team of stakeholders, including transportation professionals, interest groups, and others, as appropriate, will be assembled and charged with developing comprehensive planning and design guidelines to support this policy.

These guidelines will describe the project development process and incorporate transparency and accountability where it does not currently exist; describe how (from a planning and design perspective) pedestrians, bicyclists, transit, and motor vehicles will share roads safely; and provide special design elements and traffic management strategies to address unique circumstances.

An expected delivery date for planning and design guidelines will be set upon adoption of this policy.

**I. Policy Distribution**

It is the responsibility of all employees to comply with Departmental policies. Therefore, every business unit and appropriate private service provider will be required to maintain a complete set of these policies. The Department shall periodically update departmental guidance to ensure that an accurate and up-to-date information is maintained and housed in a policy management system.